

Part IV. Plant Assessment Form

For use with "Criteria for Categorizing Invasive Non-Native Plants that Threaten Wildlands"
by the California Exotic Pest Plant Council and the Southwest Vegetation Management Association

Electronic version, February 28, 2003

Table 1. Species and Evaluator Information

Species name (Latin binomial):	Lotus corniculatus L.
Synonyms:	
Common names:	bird's-foot-trefoil, broadleaf birdsfoot trefoil, birdfoot deervetch, babies'slippers, sheep-foot, cat's clover, crowtoes, ground honeysuckle, hop o' my thumb
Evaluation date (mm/dd/yy):	1/27/05
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Section below for list committee use—please leave blank

List committee members:	Joe DiTomaso, Alison Stanton, Joanna Clines, Cynthia Roye, Doug Johnson
Committee review date:	7/8/05 (Revised 9/13/05)
List date:	enter text here
Re-evaluation date(s):	enter text here

General comments on this assessment:

enter text here

Table 2. Criteria, Section, and Overall Scores

1.1	Impact on abiotic ecosystem processes	D	Other Pub. Mat'l
1.2	Impact on plant community	D	Rev'd, Sci. Pub'n
1.3	Impact on higher trophic levels	C	Other Pub. Mat'l
1.4	Impact on genetic integrity	U	No Information

Impact

Enter four characters from Q1.1-1.4 below:

DDCU

Using matrix, determine score and enter below:

D

2.1	Role of anthropogenic and natural disturbance	C (1 pt)	Other Pub. Mat'l
2.2	Local rate of spread with no management	C (1 pt)	Observational
2.3	Recent trend in total area infested within state	C (1 pt)	Observational
2.4	Innate reproductive potential Wksht A	A (3 pts)	Rev'd, Sci. Pub'n
2.5	Potential for human-caused dispersal	A (3 pts)	Rev'd, Sci. Pub'n
2.6	Potential for natural long-distance dispersal	C (1 pt)	Other Pub. Mat'l
2.7	Other regions invaded	C (1 pt)	Other Pub. Mat'l

Invasiveness

Enter the sum total of all points for Q2.1-2.7 below:

11

Use matrix to determine score and enter below:

B

Plant Score

Using matrix, determine Overall Score and Alert Status from the three section scores and enter below:

Not listed

No Alert

3.1	Ecological amplitude/Range	A	Rev'd, Sci. Pub'n
3.2	Distribution/Peak frequency Wksht C	C	Observational

Distribution

Using matrix, determine score and enter below:

B

Table 3. Documentation

<p>Question 1.1 Impact on abiotic ecosystem processes</p>	<p>D Other Pub. Mat'l back</p>
<p>Identify ecosystem processes impacted: nitrogen fixer, but the species is primarily a problem in turf, pasture and roadsides and not often found in wildlands.</p>	
<p>Rationale: Lotus is a N-fixing legume</p>	
<p>Sources of information: 1. DiTomaso, J., and E. Healy. in prep. Weeds of California and Other Western States</p>	
<p>Question 1.2 Impact on plant community composition, structure, and interactions</p>	<p>D Rev'd, Sci. Pub'n back</p>
<p>Identify type of impact or alteration: Displaces other species. Prevents colonization of other species in disturbed areas. However, its success depends on soil characteristics and this is not often seen in California. 9/13/05: The committee decided that its impacts in California are too low to warrant inclusion on the list.</p>	
<p>Rationale: Lateral roots form a mat at soil surface (1). Was used for revegetation of Mt. St. Helens, where it was associated with poor colonization of native vegetation (2). Often continuous over large areas of roadsides and waste places (3). Outcompetes other legumes and grasses on poor-quality soil due to its taproot and dense, shallow roots. However, on fertile soil its seedlings are small, non-aggressive, and slow-growing, and can be outcompeted (3).</p>	
<p>Sources of information: 1. DiTomaso and Healy in prep. 2. Dale, V. H. 1992. Exotic seeds reduce biodiversity on the Mount St. Helens debris avalanche. Northwest Environmental Journal 8(1): 183-185. 3. Turkington R., and G. D. Franko G.D. 1980. The Biology of Canadian Weeds. 41. Lotus corniculatus L. Canadian Journal of Plant Science 60: 965-979.</p>	
<p>Question 1.3 Impact on higher trophic levels</p>	<p>C Other Pub. Mat'l back</p>
<p>Identify type of impact or alteration: Produces some toxic compounds but poisoning of livestock is rare (1, 2). Grown as a pasture species for livestock feed and probably is a good feed for wildlife.</p>	
<p>Rationale: enter text here</p>	
<p>Sources of information: 1. DiTomaso and Healy in prep 2. Kingsburg, J. M. 1964. Lotus corniculatus L. Birdsfoot trefoil. p. 333 in Poisonous Plants of the United States and Canada. Need publisher info</p>	
<p>Question 1.4 Impact on genetic integrity</p>	<p>U No Information back</p>
<p>Identify impacts: There are numerous native species of Lotus in California (1). L. corniculatus is known to cross with other species in its genus in the laboratory but there is no information on natural hybrids (2).</p>	

Rationale: enter text here
Sources of information: Hickman, J. C. (ed.) 1993. The Jepson Manual, Higher Plants of California. University of California Press. Berkeley, CA 2. Turkington and Franko 1980
Question 2.1 Role of anthropogenic and natural disturbance in establishment C Other Pub. Mat'l back
Describe role of disturbance: Inhabits a variety of habitats, mostly disturbed areas, but based on the long list of habitats where it occurs.
Rationale: enter text here
Sources of information: 1. DiTomaso and Healy in prep
Question 2.2 Local rate of spread with no management C Observational back
Describe rate of spread: Does not spread rapidly. Can be outcompeted in healthy ecosystems. Prefers disturbed sites with high light.
Rationale: enter text here
Sources of information: DiTomaso, observational.
Question 2.3 Recent trend in total area infested within state C Observational back
Describe trend: Been around for a while and does not seem to be expanding range.
Rationale:
Sources of information: DiTomaso, observational.
Question 2.4 Innate reproductive potential A Other Pub. Mat'l back
Describe key reproductive characteristics: Insect-pollinated. Primarily outcrossing. Lacks conspicuous rhizomes but new shoots grow from the roots in spring or when the crown is damaged. Root fragments can develop into plants in some conditions and mature stems can root at nodes. Plants can survive and even thrive under mowing. Some seeds are hard-coated and require scarification or decomposition before they can germinate. These seeds are probably long-lived and can survive ingestion by animals (1). Seeds can regrow after several years' burial, including after volcanic eruptions (2). One of the few legumes that can produce buds and shoots from the root when the crown is removed. 3-yr-old seed had 69% germination, and 5-yr-old seed had 57% germination. Self-pollination is rare. Can yield 675 - 1125 kg seed/ha, with mean 20 seeds/pod and 5 pods per inflorescence (3).

Rationale: enter text here	
Sources of information: 1. DiTomaso and Healy in prep. 2. Tsuyuzaki, S. 1994. Fate of plants from buried seeds on volcano Usu, Japan, after the 1977-1978 eruptions. American Journal of Botany 81(4): 395-399. 3. Turkington and Franko 1980.	
Question 2.5 Potential for human-caused dispersal	A Rev'd, Sci. Pub'n back
Identify dispersal mechanisms: Seeds can be dispersed in mud attached to landscape maintenance equipment or with agricultural operations. Also a contaminant of seed and feed (1). Has been used as a forage crop and along roadsides (2).	
Rationale: enter text here	
Sources of information: 1. DiTomaso and Healy in prep 2. Laskey, B. C. and R. C. Wakefield. 1978. Competitive effects of several grass species and weeds on the establishment of birdsfoot trefoil. Agronomy Journal 70(1): 146-148.	
Question 2.6 Potential for natural long-distance dispersal	C Other Pub. Mat'l back
Identify dispersal mechanisms: Can be carried by water, mud, or animals. Some seeds can survive ingestion by animals (1, 2), but this is probably uncommon..	
Rationale: enter text here	
Sources of information: 1. DiTomaso and Healy in prep 2. Turkington and Franko 1980	
Question 2.7 Other regions invaded	C Other Pub. Mat'l back
Identify other regions: Native to Eurasia. Has escaped cultivation in most states and Canada (1, 2).	
Rationale: Scoring as C because it's already widespread in California.	
Sources of information: 1. DiTomaso and Healy in prep 2. Turkington and Franko 1980	
Question 3.1 Ecological amplitude/Range	A Rev'd, Sci. Pub'n back
Describe ecological amplitude, identifying date of source information and approximate date of introduction to the state, if known: Distributed throughout California, except deserts, to 1000m (1, 2). Often grows in turf or as a weed of crop fields, orchards, vineyards, landscaped areas, managed forests, and natural areas such as swales immediately inland of coastal dunes (3, 4). Also grows in disturbed grassland, wetland, and riparian areas (1, 4).	

Grows year-round in warm climates. Tolerates drought and infertile, dry, wet, saline, acidic, or limestone-based soils (1).	
Rationale: enter text here	
Sources of information: 1. DiTomaso and Healy in prep 2. CalFlora: Information on California plants for education, research and conservation. [web application]. 2004. Albany, California: The CalFlora Database [a non-profit organization]. Available: http://www.calflora.org/ . 3. Meyers-Rice, B., and J. Randall. 1999. Weed report: Lotus corniculatus. 1998-99 Weed survey. The Nature Conservancy. 4. Turkington and Franko. 1980.	
Question 3.2 Distribution/Peak frequency	D Observational back
Describe distribution: Occasionally found in wildlands, but not frequent.	
Rationale: enter text here	
Sources of information: DiTomaso, observational. Joanna Clines, Sierra National Forest, pers. obs.	

Worksheet A[back](#)

Reaches reproductive maturity in 2 years or less	Yes: 1 pt
Dense infestations produce >1,000 viable seed per square meter	Yes: 2 pts
Populations of this species produce seeds every year.	Yes: 1 pt
Seed production sustained over 3 or more months within a population annually	No: 0 pt
Seeds remain viable in soil for three or more years	Yes: 2 pts
Viable seed produced with <i>both</i> self-pollination and cross-pollination	Yes: 1 pt
Has quickly spreading vegetative structures (rhizomes, roots, etc.) that may root at nodes	Yes: 1 pt
Fragments easily and fragments can become established elsewhere	No: 0 pts
Resprouts readily when cut, grazed, or burned	Yes: 1 pt
	9 pts Total Unknowns
	A (6+ pts)

Note any related traits: enter text here

Worksheet C - California Ecological Types

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(*sensu* Holland 1986)

Major Ecological Types	Minor Ecological Types	Code*
Marine Systems	marine systems	score
Freshwater and Estuarine Aquatic Systems	lakes, ponds, reservoirs	score
	rivers, streams, canals	score
	estuaries	score
Dunes	coastal	D. present
	desert	score
	interior	score
Scrub and Chaparral	coastal bluff scrub	score
	coastal scrub	score
	Sonoran desert scrub	score
	Mojavean desert scrub (incl. Joshua tree woodland)	score
	Great Basin scrub	score
	chenopod scrub	score
	montane dwarf scrub	score
	Upper Sonoran subshrub scrub	score
	chaparral	score
Grasslands, Vernal Pools, Meadows, and other Herb Communities	coastal prairie	score
	valley and foothill grassland	D. present
	Great Basin grassland	D. present
	vernal pool	score
	meadow and seep	score
	alkali playa	score
	pebble plain	score
Bog and Marsh	bog and fen	score
	marsh and swamp	score
Riparian and Bottomland	riparian forest	score
	riparian woodland	D. present
	riparian scrub (incl. desert washes)	score
Woodland	cismontane woodland	score
	piñon and juniper woodland	score
	Sonoran thorn woodland	score
Forest	broadleaved upland forest	score
	North Coast coniferous forest	score
	closed cone coniferous forest	score
	lower montane coniferous forest	score
	upper montane coniferous forest	score
	subalpine coniferous forest	score
Alpine Habitats	alpine boulder and rock field	score
	alpine dwarf scrub	score

* A. means >50% of type occurrences are invaded; B means >20% to 50%; C. means >5% to 20%; D. means present but ≤5%; U. means unknown (unable to estimate percentage of occurrences invaded).